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Chapter 19

Inflation and Statistics—Again

Three of the more serious effects of inflation upon our statistical intelligence system are explored in this chapter. The first concerns the method of allowing for changes in export and import prices in the calculation of real gross national product (GNP) and the GNP implicit price deflator. Because of the way this is handled in the U.S. Department of Commerce estimates, the faster rise in the prices of imports, especially oil, than in the prices of exports has converted a modest trade surplus in current dollars into a much larger surplus in 1972 dollars. As a result, the foreign trade sector of the accounts has been pushing up the growth of real GNP and holding down the implicit price deflator. An alternative method of deflating net exports of goods and services, which does not have this effect, is presented. Some striking differences in the recent history of real economic growth and inflation are revealed.

The second topic deals with the lag in the availability of inflation-adjusted estimates of retail sales, inventories, and certain other widely used monthly series. The delay has various consequences, including a lack of public awareness of what is happening to the real level of economic activity. An effort should be made to release inflation-adjusted estimates simultaneously with figures in current dollars, so that the effect of inflation on the latter is readily discerned.

Finally, an improved measure of the rate of inflation embodied in the consumer price index (CPI) is needed. The measure that is most

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commonly used, the percentage change from the preceding month, seasonally adjusted, is highly erratic in its movements. Other measures, such as those that cover a three-, six-, or twelve-month span, have various advantages and disadvantages with regard to their stability, timeliness, and ease of understanding. A new measure, which achieves considerable stability, is reasonably up-to-date, and is fairly simple, is proposed for consideration. The same measure can be applied to quarterly or weekly data and to rates of change in wages, money supply, and so on.

A PERENNIAL PROBLEM

Statistical problems pertaining to the measurement of inflation and its consequences continue to plague us. Who would have forecast, in March 1980, that the 18 percent rate of inflation that the consumer price index was registering would hit zero briefly in July? How many are aware that the rising price of imported oil has *reduced* our most comprehensive measure of inflation? Why is it that, after fifteen years of experience with a worsening inflation problem, statistical agencies still release many of the numbers without, at the same time, allowing for the effect of changes in the value of the dollar?

INFLATION, THE TRADE BALANCE, AND REAL GNP

Inflation has been playing tricks with the trade balance. The trade balance—net exports of goods and services—is the only component of GNP that is larger in terms of 1972 dollars than in terms of current dollars.[1] In 1980, for example, the net export surplus was $23 billion in current dollars. One might suppose, since the dollar is not worth as much now as it was in 1972, that the surplus would be smaller than $23 billion when expressed in 1972 dollars. It was not. It was $52 billion in 1972 dollars. For the rest of GNP the relation is, of course, just the opposite. The 1980 figure for GNP excluding net exports was $2,602 billion in current dollars, but only $1,481 billion in 1972 dollars. The implicit price deflator for net exports last year was only 45 (1972 = 100), while the price deflator for the rest of GNP was 182. Many of us have thought we would never live to see a price index less than 100, but here it is.

One result of this anomaly is that net exports have been contributing a much larger percentage to real GNP (3.5 percent in 1980) than to current dollar GNP (less than 1 percent). The net export figures

have also been exerting a more potent influence than might have been expected on the rates of change in real GNP and its implicit price deflator.

From the fourth quarter of 1980 to the first quarter of 1981, for example, the implicit price deflator for total GNP rose at the annual rate of 10.0 percent. If net exports are excluded, however, and only the rest of GNP considered, the implicit price deflator rose at the rate of 9.4 percent. That is, for the great bulk of GNP (99 percent of the total, in fact) the price level was rising somewhat more slowly than for the total. To put it differently, the 1 percent of GNP constituting net exports was causing the total deflator to rise more rapidly than it otherwise would have. The 1 percent tail wagged a big dog because *its* implicit price deflator rose very rapidly between the fourth quarter of 1980 and the first quarter of 1981. The reason for this rapid rise in the price deflator for net exports was that the prices of exports rose faster than the prices of imports. Hence the surprising consequence: The overall GNP price deflator, the most comprehensive measure of inflation that we have, was *pushed up* by the relatively slow rise in the prices we pay (for imports) as compared with the prices we receive (for exports).

Correspondingly, the movement of real GNP was also significantly affected by net exports. According to the official figures, real GNP rose at the annual rate of 8.4 percent in the first quarter of 1981. Excluding net exports, the rate was 7.1 percent. That is because real net exports, as officially measured, shot up at the annual rate of 53 percent. Thus, because net exports affect the statistics so markedly, an appraisal of inflation and the performance of the real economy hinges to a large extent on how net exports are treated in the national accounts.

The official method of deflating the numbers, and a proposed alternative, are displayed in Tables 19-1 and 19-2. In the official method, export values are deflated by prices of exports, and between 1979 and 1980 this deflator rose at the annual rate of 10 percent (Table 19-1, line 2, last column). Imports are deflated by import prices, which rose at the annual rate of 18 percent (line 3, last column). Since 1972 import prices have gone up much faster than export prices, largely because of the enormous rise in the price of oil. Consequently, when the export and import values are expressed in 1972 dollars, import values are reduced much more than export values, creating a large export surplus in 1972 dollars. In the first quarter of 1981 (Table 19-2), the export surplus in 1972 dollars was $54 billion at the annual rate, nearly half again as large as the $37 billion current dollar figure.

Table 19-1. Alternative Methods of Deflating Net Exports: Effect on Real GNP and Implicit Price Deflator, 1979-1980.

	Current Dollars (billions)				*1972 Dollars (billions)*				*Implicit Price Deflator (1972 = 100)*		
			Change, 1979-1980				*Change, 1979-1980*				
	1979	*1980*	*$*	*%*	*1979*	*1980*	*$*	*%*	*1979*	*1980*	*Change, 1979-1980 (%)*
1. GNP, official	2,413.9	2,626.1	212.2	8.8	1,483.0	1,480.7	-2.3	-0.2	162.8	177.4	9.0
2. Exports	281.3	339.8	58.5	20.8	146.9	161.1	14.2	9.7	191.5	210.9	10.1
3. Imports	267.9	316.5	48.6	18.1	109.2	109.1	-0.1	-0.1	245.3	290.1	18.3
4. Net exports	13.4	23.3	9.9	73.9	37.7	52.0	14.3	37.9	35.5	44.8	26.2
5. GNP less net exports	2,400.5	2,602.8	202.3	8.4	1,445.3	1,428.7	-16.6	-1.1	166.1	182.2	9.7
6. Net exports, directly deflated[a]	13.4	23.3	9.9	73.9	8.1	12.8	4.7	58.0	166.1	182.2	9.7
7. GNP, including net exports directly deflated[b]	2,413.9	2,626.1	212.2	8.8	1,453.4	1,441.5	-11.9	-0.8	166.1	182.2	9.7
8. Terms of trade effect[c]					-29.6	-39.2	-9.6				

[a] Net exports (line 4) deflated by price deflator for GNP less net exports (line 5).

[b] Line 5 plus line 6.

[c] Line 6 minus line 4 (or line 7 minus line 1).

Source: Center for International Business Cycle Research, Rutgers University.

Table 19-2. Alternative Methods of Deflating Net Exports: Effect on Real GNP and Implicit Price Deflator, Fourth Quarter, 1980-First Quarter, 1981.

	Current Dollars (billions)			*1972 Dollars (billions)*			*Implicit Price Deflator (1972 = 100)*		
	Fourth Quarter, 1980	*First Quarter, 1981*	*Percent Change (Annual Rate)*	*Fourth Quarter, 1980*	*First Quarter, 1981*	*Percent Change (Annual Rate)*	*Fourth Quarter, 1980*	*First Quarter, 1981*	*Percent Change (Annual Rate)*
1. GNP, official	2,730.6	2,853.8	19.3	1,485.6	1,516.0	8.4	183.8	188.2	10.0
2. Exports	346.1	376.8	40.5	157.4	166.8	26.1	219.9	225.9	11.4
3. Imports	322.7	339.8	22.9	108.9	112.9	15.5	296.3	301.0	6.5
4. Net exports	23.3	37.0	535.9	48.5	53.9	52.5	48.0	68.6	317.2
5. GNP less net exports	2,707.3	2,816.8	17.2	1,437.1	1,462.1	7.1	188.4	192.7	9.4
6. Net exports, directly deflated[a]	23.3	37.0	535.9	12.4	19.2	474.8	188.4	192.7	9.4
7. GNP, including net exports directly deflated[b]	2,730.6	2,853.8	19.3	1,449.5	1,481.3	9.1	188.4	192.7	9.4
8. Terms of trade effect[c]				-36.1	-34.7				

[a] Net exports (line 4) deflated by price deflator for GNP less net exports (line 5).

[b] Line 5 plus line 6.

[c] Line 6 minus line 4 (or line 7 minus line 1).

Source: Center for International Business Cycle Research, Rutgers University.

It is the difference in the deflators that causes net exports in 1972 dollars to be larger than in current dollars. If the import and export deflators were at about the same level, then the usual relationship would hold, with the 1972 dollar figures for net exports smaller than the current dollar figures. It is ironic that the oil price explosion should have an arithmetic effect on the official GNP numbers that is just the opposite of what the economic effect is usually presumed to be. The arithmetic effect of the higher import price deflator is to reduce the implicit deflator of net exports, reduce the overall GNP deflator, and increase real GNP. This is because imports have a negative impact on GNP. The more rapidly they rise in price, the less rapid the rise in the GNP deflator. The slower the rise in import volume, the more rapid the rise in real GNP.

This result is a consequence of the method chosen to deflate net exports. It is true that, to measure the physical growth in exports, deflation by an export price index is appropriate. Similarly, to measure the physical growth in imports, deflation by an import price index is appropriate. But it does not follow that the difference between these two deflated numbers is the appropriate measure of the real value of the trade balance. If the trade balance in current dollars is negative, it is difficult to think of any real counterpart that would make it positive. Yet this can happen unless the balance is deflated directly, and until the latest (December 1980) revision of the GNP accounts, it was happening regularly (because the previous estimates of exports were much smaller than the revised ones). Quite apart from this, however, the separate deflation of imports and exports can and does produce movements in the trade balance that are very different from what they would be if the balance were deflated directly. Since the balance itself can be considered to be a component of GNP (it is net foreign investment), it is not unreasonable to deflate it directly, thus treating this component in the same manner as the other components, such as domestic investment or consumption expenditures.

A method for doing this that has been advocated for many years by Solomon Fabricant and other students of this subject is to deflate the trade balance (net exports) by a general price index and incorporate the resulting real balance in real GNP.[2] A general price index that seems suitable for this purpose is the price deflator derived from total GNP exclusive of net exports. This is a measure of general purchasing power—it covers virtually the whole of GNP—and its use for this purpose leaves the deflator of total GNP unaffected by the trade balance itself. That is, since the deflator used for net exports is the same as for the rest of GNP, the overall deflator is the same also. The

calculation for net exports and GNP is shown in Tables 19-1 and 19-2, and the effect on net exports in recent years is shown in Figure 19-1. The level and trend of the real balance derived by this method (bottom line) is very different from that shown by the official method (middle line) and corresponds more closely to the current dollar measure (top line).

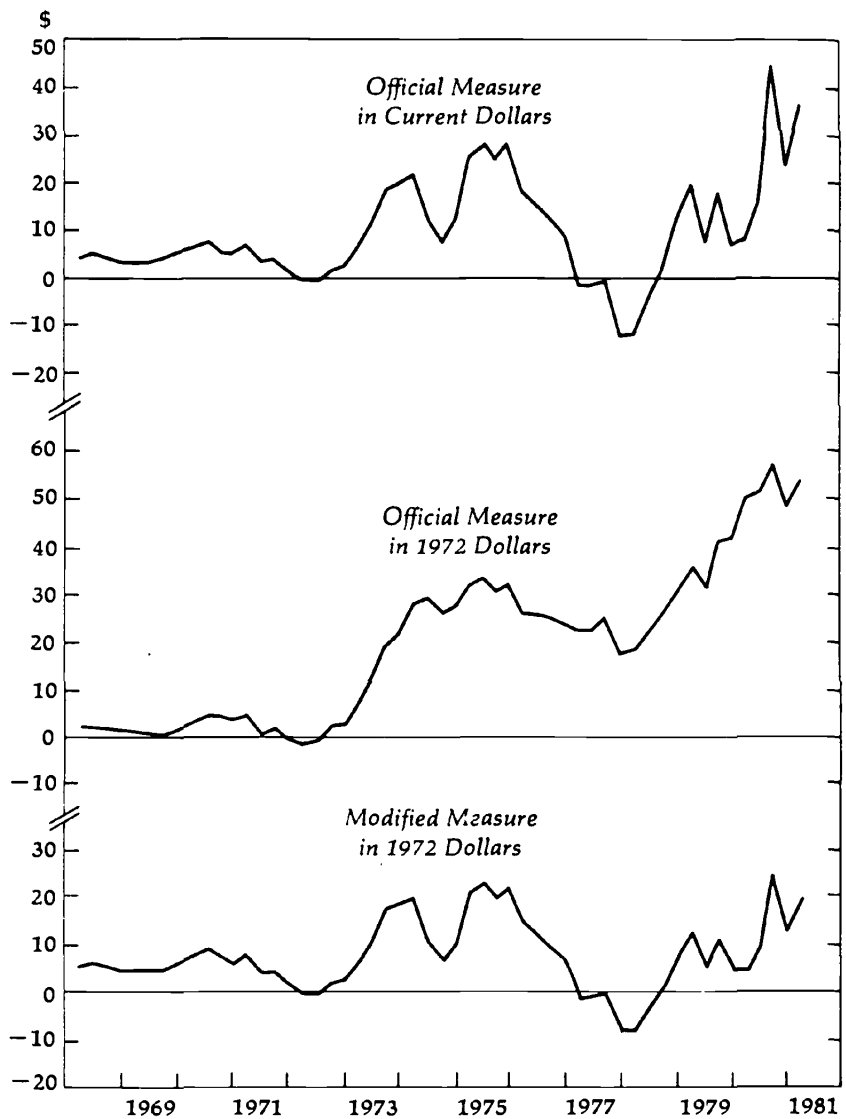
Lately, the use of this method makes a remarkable difference in the level and growth of real GNP, and an equally remarkable difference in the inflation rate. During 1979 and early 1980 the growth in real GNP is reduced to zero, whereas the official figures rose gradually until the peak level of real GNP was reached in the first quarter of 1980 (see Figure 19-2). That is to say, the impact of the recession on real GNP developed sooner and more plainly in the modified figures than in the official numbers. In both the official and the modified figures the recession low was reached in the second quarter of 1980, and both show a substantial recovery since then, though it is more marked in the modified figures.

As for inflation, the alternative calculation shows that considerably higher rates were reached during 1979 and that there was a much sharper decline during the recession itself (see Figure 19-3). Between the first and third quarters of 1980 the inflation rate dropped from 11.5 percent to 6.5 percent according to the modified measure, whereas the official measure remained around the 9.5 percent level. In general, excluding the influence of net exports on the measure of inflation shows it to conform more closely to business cycle downswings as well as upswings.

What all this means is that the way the real trade balance is measured can substantially alter the behavior of the nation's most comprehensive measure of real economic activity and of inflation. This finding will not come as a surprise to students of national income accounting. They have argued about it for years and not only in this country, since in many countries foreign trade is a more important factor than in the United States. But the method of deflating the trade balance has recently become more important, partly because rates of inflation are higher and partly because trade balances are now greatly affected by imports or exports of oil.

In the United Kingdom, for example, the Central Statistical Office has since 1975 regularly published a measure, called "real national disposable income," which is distinguished from their real gross domestic product (GDP) chiefly by the fact that the trade balance is deflated by a single price index (the price of imports) whereas in real GDP, exports are deflated by export prices and imports by import prices (as in the United States).[3] At the time this measure was con-

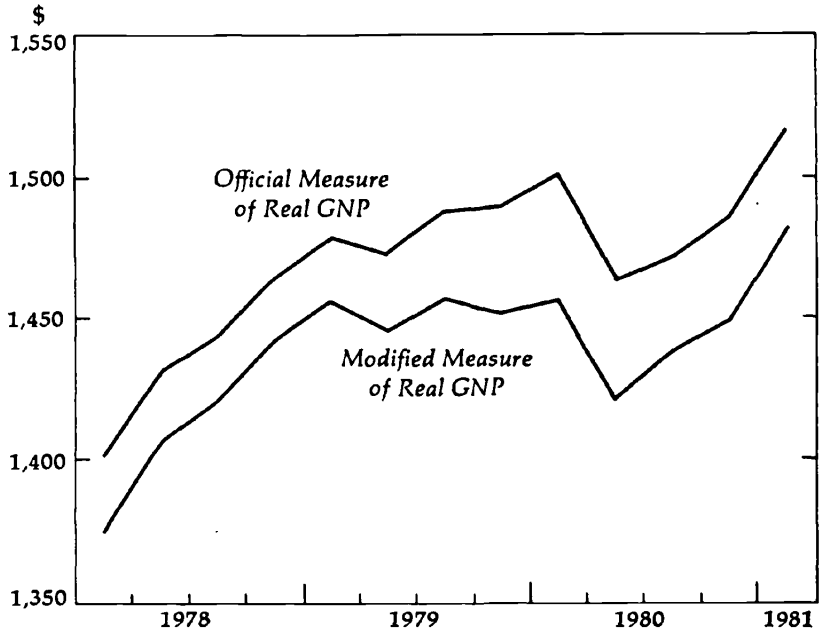
Figure 19-1. Net Exports in Current and in Constant Dollars, 1968-1981, (*billions of dollars*).



Note: In the official measure exports are deflated by export prices and imports by import prices. In the modified measure net exports are deflated by the GNP implicit price deflator excluding net exports.

Source: Center for International Business Cycle Research, Rutgers University. Based upon revised GNP data released in January 1981.

Figure 19-2. Real GNP with Alternative Measures of Net Exports, 1978-1981 (*billions of 1972 dollars*).



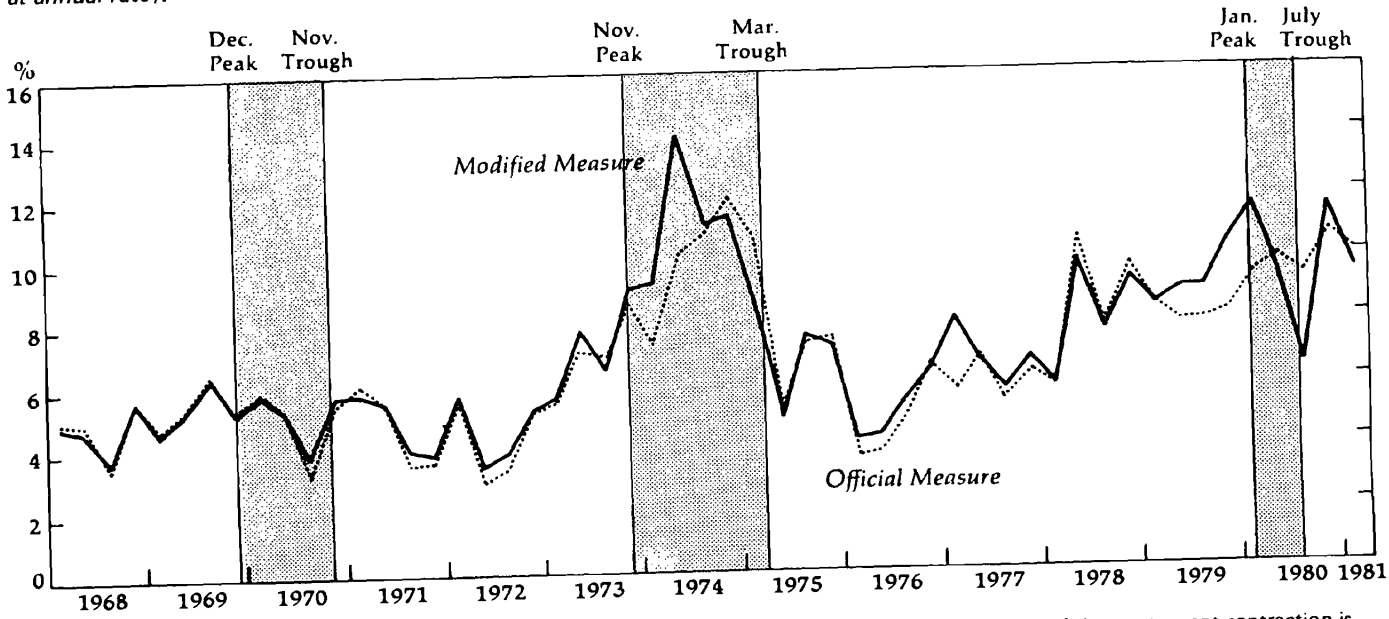
Note: In the official measure exports are deflated by export prices and imports by import prices. In the modified measure net exports are deflated by the GNP implicit price deflator excluding net exports.

Source: Center for International Business Cycle Research, Rutgers University.

structed in 1973-1974, the effect of directly deflating the trade balance was similar to what it has been in the United States: it reduced the measure of real output. Recently, however, the effect in Britain has been just the opposite, with the directly deflated measure exhibiting greater real growth and implying less inflation. This is because Britain is now exporting North Sea oil and getting the benefit of high oil prices, a benefit that is not reflected in the usual measure of real output (GDP).

Economists have usually discussed this issue in terms of whether a change in the terms of trade should or should not be considered to affect the nation's real output or income. If the same physical quantity of exports will no longer buy as large a physical quantity of imports, has the nation's real output been diminished? When exports are deflated by export prices and imports by import prices, a change in the terms of trade has no effect on the measure of output. When

Figure 19-3. Alternative Measures of the GNP Implicit Price Deflator, 1968-1981 (*percentage change from preceding quarter at annual rate*).



Note: The modified measure excludes net exports. Shaded areas indicate business cycle contractions; the end of the most recent contraction is tentatively set at July 1980.

Source: Center for International Business Cycle Research, Rutgers University.

both are deflated by the same price index a change in the terms of trade is reflected in the measure of output. Probably the most widely accepted view is that a nation's real *income* is diminished when imports become more expensive relative to exports, but that its real *output* is not affected. That is why the British have two measures, one referred to as income, the other as output.

It can be argued, however, that a nation's output and income are conceptually the same. Virtually no one disputes this when both are measured in current prices. Indeed, from the outset of national accounting this position has been accepted and estimates based on measures of income and on measures of output (or expenditure) have been viewed simply as different ways of estimating the same total, the differences being referred to as a statistical discrepancy. Why then should real output be different from real income? Is a dollar's worth of output different from a dollar's worth of income when both are measured in relation to the general level of prices? Or is the general level of prices different when it is to be used to measure real output than when it is to be used to measure real income? In particular, which is the more relevant measure of the general price level, an index that goes up faster when the prices we pay for imported oil go up faster than the prices we get for exported wheat, or an index that goes up more slowly in that event?

By the time this chapter appears in print the U.S. Department of Commerce may have enlightened us on these matters by producing a measure of real national product in which net exports of goods and services will be deflated directly by a price index, namely the price index for imports (as the British have already done).[4] The results, to judge from past experience, are not likely to differ much from those based on the method proposed here, where net exports are deflated by the price index for the rest of GNP. Whichever method persists, inflation will have stirred up an important issue.

DEFLATE NOW, REVISE LATER

One of the merits of the national accounts statistics is that estimates expressed in constant prices are released at the same time as estimates in current dollars. Hence one can see what has happened to the physical volume of GNP and its components and at the same time observe the current dollar magnitudes and the implicit change in the price level. With many of our monthly statistics, on the other hand, deflated data are released only later. This is true, for example, of retail sales, of total manufacturing and trade sales, of inventories, and of new orders. One of the consequences is that the press gives

almost exclusive attention to the current dollar figures, since these are up to date, despite the fact that the deflated numbers may give a very different impression of the trend of business (see Figure 19-4).

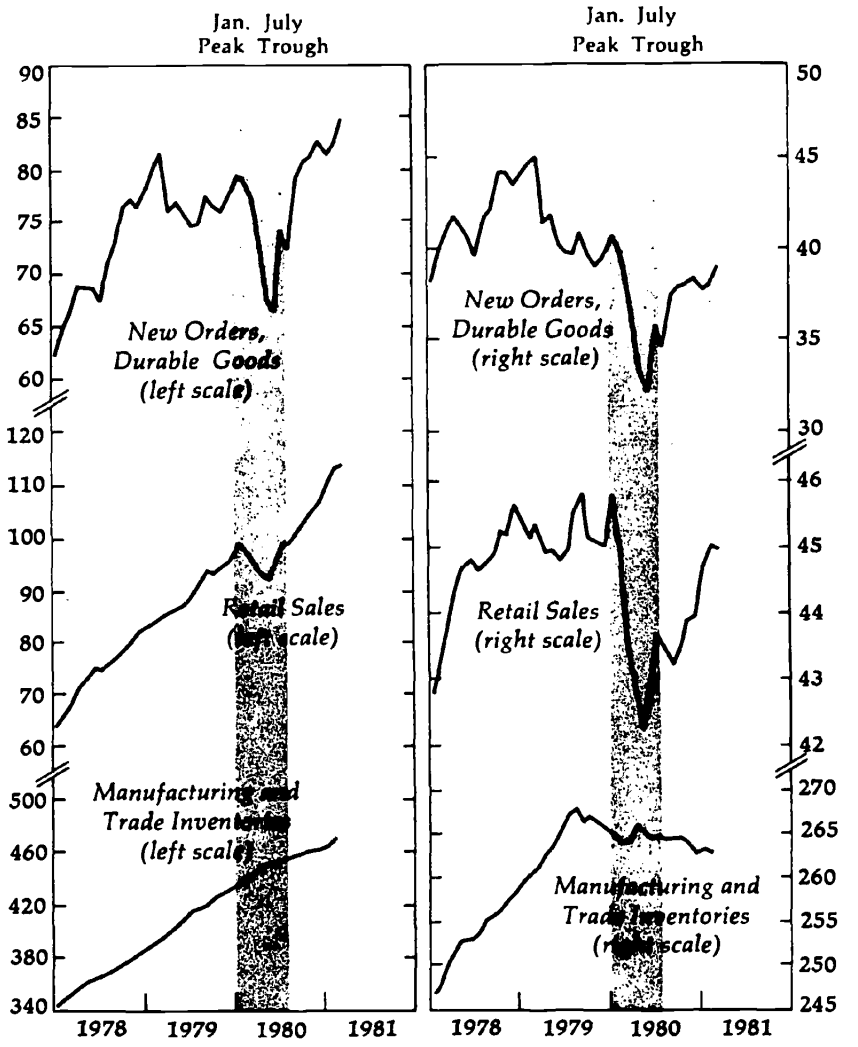
Another consequence is that analysts make their own estimates of the deflated numbers, often on the basis of much less information than is available to the statistical agency. Of course, the agency does not have as much information on prices as it would like to have or will have at a later date, but this simply means that its preliminary estimates will have to be revised. The question is whether the preliminary estimates are sufficiently accurate to be useful. Judging from the efforts of analysts to provide their own preliminary estimates, the answer seems to be yes. When one is seeking evidence of recession or of recovery, under conditions of double-digit inflation, even rough estimates of the physical volume of sales, orders, and inventories are welcome. In appraising the effect of policies to fight inflation, promptly deflated statistics are a necessity. If the quarterly GNP figures can be deflated when they are first released, so can the monthly figures on which they are based.

Our statistical arsenal requires attention in another respect as well. Some figures are reported only in current dollars and are not published in deflated form at all. Examples are the monthly statistics on inventories by stage of processing, the stock of unfilled orders, and the volume of credit. Each of these can be linked, conceptually, with other statistics that are published in deflated form. Hence for analytical purposes they should be deflated also. The physical volume of materials inventories is needed to compare with output and to assess the extent of speculative buying in commodity markets. The physical stock of unfilled orders indicates how fully utilized capacity is and to what extent changes in inventories on order are offsetting or augmenting changes in inventories on hand. The flow of credit is related, of course, to both the physical volume of transactions and the price level. Adjusting the credit aggregates to allow for inflation distinguishes the physical component and facilitates comparison with other physical measures such as output and employment. How much credit is simply being used to pay higher prices?

WHAT IS THE RATE OF INFLATION?

Probably the most popular conception of the rate of inflation is a figure that is not even published by the statistical agency responsible for it. It is the seasonally adjusted month-to-month percentage change in the consumer price index, expressed at an annual rate. The Bureau of Labor Statistics (BLS) does publish the monthly percen-

Figure 19–4. Deflated and Undeflated Statistics Prior to, During, and After the 1980 Recession (*billions of dollars*).



Note: The shaded area is the business cycle contraction beginning January 1980; the end of the contraction is tentatively set at July 1980.

Source: Center for International Business Cycle Research, Rutgers University.

tage change, but does not express it at an annual rate. News writers and TV commentators usually prefer the annual rate, and convert the monthly rate to that basis. On the other hand, the BLS does publish several other rates in annualized form, over a three-month span, a six-month span, and a twelve-month span (that is, from the same month a year ago).

The BLS's reason for not annualizing the monthly rate was, and is, that monthly changes are highly erratic and, consequently, the assumption implicit in the annualizing procedure—namely, that the annual rate is what would be realized if the monthly rate persisted for twelve months—is very unlikely to hold true. Experience in 1980 vividly illustrated this point. In January, February, and March, the seasonally adjusted monthly rate was 1.4 percent. Annualized, this worked out to a rate of 18 percent. But these monthly rates did not persist and indeed dropped to zero by July. The zero rate was an extreme in the opposite direction and was widely recognized as such. Nevertheless, the monthly rates continue to receive much attention, and they continue to be highly unrepresentative of the persistent rate of inflation.

In the long run, I hope, statistical data disobey Gresham's law. Good statistics do drive out bad. But the law has a certain power in the short run, and in the case of the rate of change in the CPI a single "bad" statistic has driven out a variety of "good" ones. It is easy to show that the three-month rate, or the six-month rate, or the twelve-month rate is less erratic than the one-month rate, and hence offers a better guide to what the underlying rate of inflation is. All these rates are published and available, but they rarely make headlines. Perhaps there are too many of them.

An alternative would be for the BLS to select and emphasize a single rate, which might become known as "the" rate of inflation. It would become known in the same way that "the" rate of unemployment is known. Naturally, other rates could be computed and used by analysts, but the public would be better informed than by a rate that swings from 18 percent to zero in the course of five months.

The candidate that I would propose for this honorable post is not now published by the BLS, nor is it widely used anywhere. But its newness may give it a novelty that existing rates do not have, and it has superior properties of stability. It is a rate determined by dividing the current month's CPI (seasonally adjusted) by the average CPI for the preceding twelve months. The span covered by such a rate is 6.5 months—the twelve-month average precedes the current month by that length of time. Hence the annual rate of change is roughly twice

the percentage change between the twelve-month average and the current month's index.

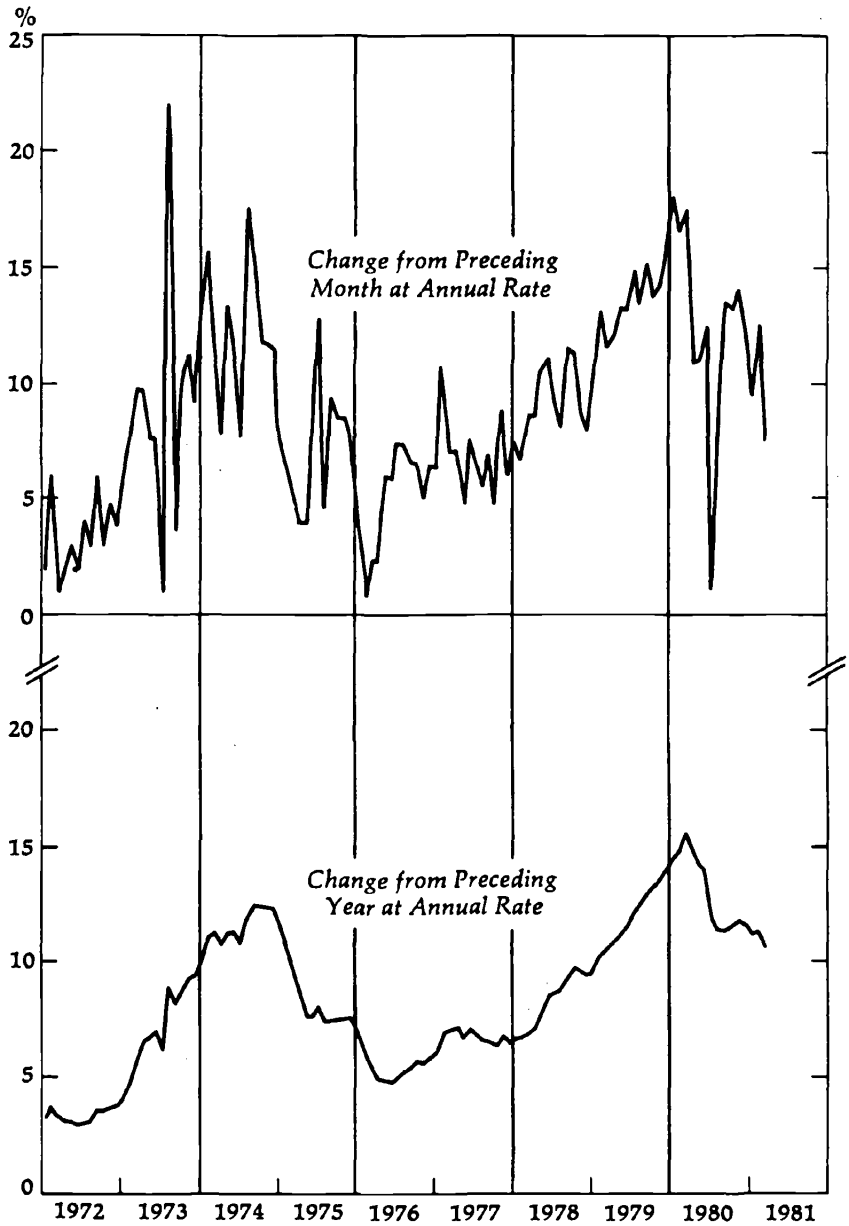
When, for example, the CPI in March 1981 was 265.5 (1967 = 100) on a seasonally adjusted basis, the average for the preceding twelve months (March 1980 through February 1981) was 251.5. The rate of inflation, therefore, was $[(265.5 \div 251.5)^{12/6.5} - 1]\ 100 = 10.5$ percent. What this method does is take the average of the preceding twelve months as a base, and compare the current month's index with it to see how much inflation has raised the current index. The twelve-month average is a stabler figure than any single month, such as the preceding month, which is the base for the month-to-month change. Last month's index may be affected by some special factor that raised or lowered the index in that month. The twelve-month average is much less subject to the influence of special factors. It is also not subject to revision because of changes in seasonal adjustment factors (which are revised every year), since over a twelve-month period the seasonal factors balance out.[5]

How stable the new rate is can be seen in Figure 19–5, which compares the month-to-month rate (annualized) with the proposed rate (also annualized). The wild fluctuations in the former are largely eliminated in the latter. The 18 percent rates in January, February, and March 1980 are reduced to about 15 percent, and the zero rate of July 1980 is raised to about 11 percent. Similarly, during the rise and fall of the inflation rate in 1972–1976, the new rate makes it much easier to see what was happening. In 1973, for instance, the monthly rate dropped as low as 1 percent (annualized, in July) and climbed as high as 24 percent (in August). In the same months, the new rate was 6 percent and 9 percent, respectively.

It is true that, if the month-to-month rate rose smoothly to a peak and then smoothly down again, the new rate would be likely to continue rising a month or two longer. That is, it would lag. Something like this happened in 1974, when the high in the monthly rate was reached in August (17 percent) while the high in the new rate was not reached until September (12 percent). A better example of the lag occurs at the next trough, in 1976, where the monthly rate hits its low (1 percent) in February while the new rate continued to drop until June (5 percent). But the fluctuations in the monthly rate make it very difficult, at any given time, to tell whether a true low has been reached or just a false bottom (as in 1973 or in 1975). The new rate is not perfect in this respect either, but it is surely better.

By computing and publishing a rate such as the one proposed (or one with equally good credentials) and eliminating all the other rates

Figure 19-5. Rates of Change in the Consumer Price Index, 1972-1981.



Source: Based upon seasonally adjusted consumer price index for urban households, from the Bureau of Labor Statistics. Center for International Business Cycle Research, Rutgers University.

it publishes, the Bureau of Labor Statistics would be doing the public a service. It would tell the nation what the rate of inflation is, in terms of the most widely known price index, the CPI. With inflation finally recognized as a number one economic problem, we need a number one inflation rate to tell us how we are getting on with it.

NOTES TO CHAPTER 19

1. For brevity I shall use the terms "trade balance" and "net exports of goods and services" interchangeably. The merchandise trade balance is, of course, more limited in coverage, excluding the services component.

2. See Solomon Fabricant, "Capital Consumption and Net Capital Formation," in Conference on Research in Income and Wealth, *A Critique of the United States Income and Product Accounts*, Studies in Income and Wealth, vol. 22 (New York: NBER, 1958), p. 447. Fabricant discussed this method in an unpublished memorandum, prepared for the NBER's Capital Requirements Study, June 1951, "Deflation of Foreign Investment." Simon Kuznets used the measure in the final report of the study, *Capital in the American Economy* (Princeton, N.J.: Princeton University Press, 1961); see p. 492 for annual data, 1919-1955.

3. J. Hibbert, "Measuring Changes in the Nation's Real Income," *Economic Trends*, 255 (London: Central Statistical Office, January 1975): xxviii-xxxv.

4. I am indebted to Edward Denison of the Bureau of Economic Analysis for allowing me to examine his manuscript on this subject prior to publication. See his "International Transactions in Measures of the Nation's Production," *Survey of Current Business* (May 1981): 17-28.

5. It would be possible, and indeed preferable, to use original data rather than seasonally adjusted data to compute the moving twelve-month average, though ordinarily there will be little difference between the two averages. But the current month's index *must* be seasonally adjusted since the objective is to obtain a seasonally adjusted inflation rate.